Structural characterization, thermal, dielectric and vibrational properties of tris(allylammonium) hexabromoantimonate(III), $(C_3H_5NH_3)_3SbBr_6$.

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The novel inorganic–organic hybrid material, allylammonium hexabromoantimonate(III), $(C_3H_5NH_3)_3SbBr_6$, has been synthesized and its structure has been determined by means of the single-crystal X-ray diffraction studies at five temperatures (273, 248, 220, 170 and 100 K). At room temperature the compound crystallizes in the monoclinic space group, *C*2/*m*. Its crystal structure is composed of the discrete anions and three non-equivalent allylammonium, $(C_3H_5NH_3)^+$, cations. In $(C_3H_5NH_3)_3SbBr_6$ three solid–solid structural phase transitions are detected: a continuous one at 260/256 K (on heating–cooling) from phase I to II, a discontinuous one at 227/208 K (II→III) and another discontinuous at 197/191 K (III→IV). The electric properties of the compound have been measured in a wide temperature region (150–300 K). Temperature-dependent vibrational properties in the frequency region 3500–500 cm^{-1} have been reviewed. Possible mechanisms of the phase transitions in $(C_3H_5NH_3)_3SbBr_6$ are discussed on the basis of the presented results.

Słowa kluczowe

Hexabromoantimonate(III), Allylammonium, Thermal properties D, dielectric properties, X-ray diffraction, Infrared and Raman spectroscopy

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